



SCHOOL OF LAW

Civil Justice Clinic  
Interdisciplinary Environmental Clinic

March 29, 2004

Ms. Leanne Tippet  
Missouri Department of Natural Resources  
Air Pollution Control Program  
P.O. Box 176  
Jefferson City, MO 65102-0176

Re: Draft Construction Permit for Holcim's Proposed Lee Island Cement Plant Project  
Project No. 2000-05-077

Dear Ms. Tippet:

The undersigned are today filing detailed comments on the above-referenced draft air pollution permit on behalf of the American Bottom Conservancy, Missouri Coalition for the Environment, Ozark Chapter of the Sierra Club, and Webster Groves Nature Study Society.

As a supplement to those comments, and to be considered as a part thereof, we are also filing herewith several documents prepared for the New York Department of Environmental Conservation ("NYDEC") regarding the proposal of a Holcim subsidiary, St. Lawrence Cement to build a similar cement plant in Greenport, New York. The documents concern the submittals filed by St. Lawrence Cement with the NYDEC, purporting to establish that Selective Catalytic Reduction ("SCR") is not a feasible technology for the proposed plant. When Holcim responded to the DNR's inquiry requesting a further evaluation of the feasibility of SCR as Best Available Control Technology ("BACT") for the proposed Lee Island plant, Holcim explained that the Greenport and Lee Island plants are sufficiently similar that the information relevant to the feasibility of SCR at Greenport is equally relevant to the feasibility of SCR at Lee Island. To quote Holcim's submittal (p. 15 of the purported BACT analysis) to the DNR: "Compelling, the similarities in Lee Island's gas stream characteristics at a potential SCR inlet to those at Greenport show that SLC's RFP responses are applicable to Lee Island." In light of Holcim's admission, therefore, the following documents critiquing the St. Lawrence Cement submittal, and establishing that SCR is indeed a feasible technology for these two plants, are highly relevant to this proceeding. The attached documents include:

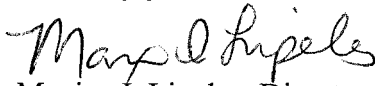
1. Comments to the New York Department of Environmental Conservation by the Massachusetts Department of Environmental Protection, March 4, 2004

Ms. Leanne Tippet  
March 29, 2004  
page two

2. Letter from State of Connecticut, Attorney General Richard Blumenthal, March 18, 2004, with attached March 1, 2003 Memorandum from Connecticut Department of Environmental Protection
3. Letter from KWH Catalysts, Inc. to Camp Dresser & McKee Inc., February 27, 2004
4. Response of Friends of Hudson to St. Lawrence Cement's Supplement LAER Analysis, March 24, 2004
5. Executive Summary of #4 above.

We believe that these documents are critical to the DNR's decision on the Holcim permit, and demonstrate that the permit as presently drafted falls woefully short of the legal requirements that new facilities of this magnitude employ Best Available Control Technology.

Sincerely yours,



Maxine I. Lipeles, Director  
Interdisciplinary Environmental Clinic  
(314) 935-5837  
milipele@wulaw.wustl.edu

Attorneys for American Bottom Conservancy, Missouri Coalition for the Environment,  
Ozark Chapter of the Sierra Club, and Webster Groves Nature Study Society

**March 24, 2004**

**COMMENTS TO  
THE NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
BY THE MASSACHUSETTS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
ON THE  
NO<sub>x</sub> LAER SUPPLEMENTAL ANALYSIS FOR THE  
PROPOSED PORTLAND CEMENT PLANT IN GREENPORT, NEW YORK**

**DEC # 4-1040-00011 (St. Lawrence Cement Company)**

On July 29, 2003, the New York Department of Environmental Conservation (DEC) required the St. Lawrence Cement Company (SLC) to update its NO<sub>x</sub> LAER analysis for the proposed Greenport portland cement plant. In December 2003, SLC submitted its report entitled “Lowest Achievable Emission Rate Supplemental Analysis – St. Lawrence Cement, Greenport Project” (the “Supplemental Analysis”).

DEC provided interested parties an opportunity to comment on the NO<sub>x</sub> LAER Supplemental Analysis and requested comments by March 24, 2004. DEP is grateful to the New York DEC for the opportunity to comment on this important matter.

Massachusetts has a significant interest in maximizing NO<sub>x</sub> emission reductions from the proposed facility. Massachusetts is close to and directly downwind of the facility, the facility would be a significant source of NO<sub>x</sub> emissions, NO<sub>x</sub> is a precursor to ozone, Massachusetts is in non-attainment for ozone, and the new 8-hour ozone standard will make attainment even more difficult. DEC’s upcoming determination on the updated LAER analysis provides an opportunity for substantial reductions in NO<sub>x</sub> emissions from the proposed facility.

The matter before you is a difficult but crucial decision that would affect air pollution control on this industry type throughout the nation, including areas upwind of New York. Reasonable regulators should take every opportunity to advance air pollution control technology when technical information indicates it is reasonable to do so. The Clean Air Act fully supports a technology-forcing implementation of the law. *See Union Electric Co. v. EPA*, 427 US 246, 257 (1976) (the Clean Air Act places “the primary responsibility for formulating pollution control strategies on the States, but

nonetheless subject the States to strict minimum compliance requirements. These requirements are of a ‘technology-forcing character’”) (*quoting from Train v. NRDC*, 421 US 60, 91 (1975)). The technical feasibility of control technology is within the purview of the review authority and it is incumbent on regulators addressing new source/non-attainment review, as DEC correctly determined in requiring the Supplemental Analysis, to carefully evaluate the application of new air pollution control technology to determine the most stringent emission limitations achieved or expected to occur in practice.

In the Supplemental Analysis, SLC concludes that LAER for Nitrogen Oxide (NO<sub>x</sub>) control is achieved by an approximately 40% removal rate achieved by Multi-Stage Combustion Control (MSC) paired with Selective Non Catalytic Reduction (SNCR) technology. However, SLC’s conclusion does not represent LAER.

DEP believes that Selective Catalytic Reduction (SCR) would provide LAER for controlling NO<sub>x</sub> at Greenport because it appears able to achieve up to or potentially greater than 80% NO<sub>x</sub> removal – which is a significantly better removal rate than MSC/SNCR. At 80% removal, SCR would reduce NO<sub>x</sub> emissions up to approximately 1800 tons per year more than currently proposed, thus making this a compelling opportunity for better air quality. In brief, DEP supports its LAER analysis on among other things vendor guarantees, installation and operation on a commercial portland cement plant for the past two or more years, and SCR achievement of a NO<sub>x</sub> reduction efficiency on the cement plant that is much lower than the NO<sub>x</sub> reduction in the preliminary determination of SNCR/MSC as LAER for Greenport.

DEC requested that comments address the issues outlined in DEC’s letter to SLC dated July 29, 2003 to the extent possible. DEP’s comments below are organized as Permitting Flexibility, Vendor Guarantees for SCR System, SCR at Existing Facilities, SNCR and MSC, and Response to SLC Arguments.

### **Permitting Flexibility**

To manage performance uncertainties when applying new technologies like SCR to cements plants, DEC could encourage SCR use through careful and targeted regulatory flexibility, much like the “test and set” approach that is proposed for the current MSC/SNCR control system. The DEP has applied this type of flexibility and found it to be a useful tool in bridging some regulatory and performance risks. This type of government and industry cooperation has lead to the advancement and

commercialization of air pollution control technology through out the country. Examples of this type of partnering in Massachusetts brought acid gas control to municipal solid waste combustors and NOx control to electric generating facilities.

### **Vendor Guarantees for SCR System**

#### **1. Vendors Would Guarantee SCR for Greenport**

Based on analysis, conversations with vendors and review of vendors' written materials, vendors would guarantee SCR for the proposed Greenport facility. For instance, the vendor KWH Catalysts, Inc. (KWH), in a letter dated February 27, 2004 from KWH to Camp, Dresser & McKee, Inc. (consultant for one of the parties in this proceeding) sets forth the terms it would guarantee for SCR (the letter is attached hereto as Exhibit A, and is referred to as the "KWH 2/27/04 letter"). *See also*, letter from vendor Alstom to SLC dated October 20, 2003 (Alstom's response to SLC's October 14, 2003 letter concerning request for confirmation of specific bid specifications) (attached hereto as Exhibit B)(referred to in these comments as "Alstom 10/20/03 letter"). In the KWH 2/27/04 letter, KWH confirms that with appropriate modifications it would meet the performance guarantees in SLC's bid specifications that SLC provided to vendors in August 2003.

Vendors of SCR would guarantee a NOx reduction efficiency far greater than the approximately 40% efficiency available through SNCR/MSR. For instance, KWH confirms it could meet a minimum 85% NOx reduction. *See* KWH 2/27/2004 letter. KWH states that the minimum temperature to the SCR must be 315 C (versus the 300 C in SLC specifications). KWH's minimum temperature alternative seems reasonable and appropriate. The MSR lowers temperature by staging combustion in alternating oxygen rich : oxygen "starved" (fuel rich environments) which lowers combustion flame temperature thereby attempting to reduce NOx formation. MSR is equivalent to the use of low NOx burner technology used for boilers. The application of SCR technology in retrofit installations for the coal fired utility boiler industry requires the installation of a bypass duct around the economizer section of the boiler, extracting only a portion of the "hot" exhaust gas needed to raise the temperature of the exhaust gas entering the SCR system. As such, the Greenport facility could design an exhaust gas bypass duct around the last pre-heater cyclone which would provide sufficient "temperature" to maintain exhaust gas temperature entering the SCR system above 320 C.

Vendors could also provide guarantees for NH<sub>3</sub> slip, Gas-Side Pressure Loss, SCR system availability of 98%, and other guarantees listed in SLC's bid specifications. *See, e.g., KWH 2/27/04 letter; see also Alstom 10/20/03 letter.*

Vendors believe that SO<sub>2</sub>/SO<sub>3</sub> conversion of less than 1% by mole should not be applied to a cement process gas stream. *See, e.g., KWH 2/27/04 letter.* KWH's reasons include that SO<sub>3</sub> and SO<sub>2</sub> will not leave the stack because they are captured in the process itself by the large amount of free lime as CaO in the gas stream. *See KWH 2/27/04 letter.* DEP concurs with this technical analysis<sup>1</sup>.

KWH confirms it would meet a guarantee of 16,000 hours of catalyst life, and within a few weeks expects to provide a 24,000 hour life guarantee after it completes bench reactor tests on catalyst test elements from Solnhofen. *See KWH 2/27/04 letter.* KWH states that the Solnhofen SCR has operated successfully for over 24,000 hours. DEP believes the difference between 16,000 and 24,000 hours of catalyst life guarantee is not a dispositive issue for the LAER analysis.

SCR catalyst guarantees have evolved with operational experience obtained in a specific combustion and/or industrial application. Early application (circa 1990) of SCR on natural gas fired combustion turbine installations in Massachusetts resulted in SCR catalyst life guarantees of approximately 24,000 hours or 3 years. Currently, these catalyst life guarantees have been lengthened to 5 to 6 years (approximately 40,000 to 50,000 hours) depending upon the customer and/or regulatory requirements. These current guarantees were not obtainable when SCR technology was first implemented upon natural gas fired combustion turbines. Furthermore, SCR technology has recently (late 1990's to early 2000's) been applied in retrofit installations to coal fired utility boilers, and these high dust environments have been able to obtain SCR catalyst life guarantees of 2 to 3 years (approximately 16,000 to 24,000 hours). The SCR vendors are indicating that these guarantees are the norm since SCR technology has limited long term operation on high dust, coal fired utility boilers.

---

<sup>1</sup> Although KWH and Alstom/Haldor Topsoe believe they have overcome the SO<sub>2</sub>/SO<sub>3</sub> conversion issues with catalyst adjustments and temperature limits, the report "Recent Experience With SCR Catalyst For PRB Fuels, High Sulfur Fuels, And Low Dust Applications", Morita, I., Ogasahara, T., and Franklin, H., (presented to The American Power Conference, April 15-17, 2002) (attached hereto as Exhibit C) offers data to support the vendors' claims, and also addresses SLC's concerns on this issue.

Vendors would provide a liquidated damages provision consistent with what it believes to be the industry standard for pollution control systems including SCRs, which in essence is up to 100% of the contract price paid to vendor. *See, e.g.* KWH 2/27/04 letter. This appears consistent with the guarantee the vendor for SNCR provided SLC.

Finally, vendors are not conditioning guarantees on first running a pilot test program. *See* Alstom 10/20/03 letter at 4. Also, back in its October 3, 2003 letter to SLC, KWH stated that the stringent emission rates required for Greenport would be reasonably expected to be achieved, but only after a pilot test program is conducted on a kiln similar to Greenport “so that technical uncertainties for the SCR/catalyst supplier are addressed.” However, putting aside interpretations of that letter, due to KWH’s more recent experience with SCR at Solnhofen, KWH would provide its guarantees for Greenport without the need for a pilot test program. *See* email dated February 25, 2004 from Tom Lugar, President, KWH (attached hereto as Exhibit D) (with the Solnhofen actual performance in hand as of February 2004, “KWH does not see the need to require a slipstream pilot test”). The vendor appears confident that its experience at the portland cement plant in Solnhofer has proven the essential compatibility of SCR with cement plant emissions.<sup>2</sup>

#### 1. SLC’s Attempt To Obtain Vendor Guarantee for SCR Could Have Succeeded

The SCR vendors indicated that SLC’s RFP established very rigid operational parameters and imposed unreasonable penalties if the system failed. The RFP basically required that the SCR system perform within bid specifications at all times and under all conditions so their primary concerns centered on the following:

- Providing a 90 percent NOx reduction guarantee at all times and under all conditions
- Providing a 24,000 hour catalyst life guarantee
- Exhaust temperatures below the nominal operational range for SCR for extended periods

<sup>2</sup> This vendor guarantee is substantial. It is a type of vendor guarantee that DEP has and would rely upon in DEP’s permitting proceedings. Also, in New York, DEC has in appropriate circumstances relied on much less information as a vendor guarantee. In *Ramapo Energy*, the Commissioner accepted a telephone conversation from a vendor as a sufficient vendor guarantee, overruling the ALJ’s determination that a phone conversation is an insufficient guarantee. *See Ramapo*, 2001 N.Y. ENV. Lexis 59, at \*25-26.

- Limits on SO<sub>2</sub> oxidation to limit ammonium sulfate production (detached plume control)

After speaking with representatives of KWH Catalyst Inc. and Alstom Power Inc. (two of the four vendors selected to receive SLC's RFP), DEP learned that contrary to what SLC has presented in the Supplemental Analysis, they believe they were responsive to the RFP. Both proposals were rejected by SLC as not being "firm bids". Both vendors believe that SCR is a viable technology for Greenport plant and that it will perform at or near the levels found at the Solnhofer plant in Germany.<sup>3</sup>

Alstom Power Inc. asserts that it can design, build and guarantee a Haldor Topsoe catalyst for the Greenport plant. Its responses to SLC's RFP, contained in the Supplemental Analysis Attachment 2, indicates the same.

In a letter dated October 20, 2003 to SLC, Alstom responded (given only 4 business days to respond) to SLC's October 14, 2003 comments on Alstom's proposal. Alstom's 10/20/04 letter is very much like the recent KWH letter (to CDM dated February 27, 2004) in that Alstom provides virtually all the guarantees that SLC demanded in its RFP. However, it is DEP's understanding that SLC never responded to Alstom's 10/20/03 letter and that Alstom believes that it remains a viable respondent to the RFP.

SLC's critique of Alstom's response, in the December 2004 Supplemental Analysis section 4 (4-57 to 4-64) (cited in the remainder of DEP's comments as "S.A."), makes it appear that there are large differences between what the bid specifications called for and what Alstom provided in response. However, a fair read of the documents reveals, that where there are open issues, the issues are resolvable or are not significant to determining LAER:

- guarantee for bid specification section 5.10.4 (Supplemental Analysis at 4-57): SLC is

<sup>3</sup> Both vendors indicated the costs for controlling a ton of NO<sub>x</sub> at Greenport may be in the \$4-6,000 range which is well within the range of NO<sub>x</sub> reduction costs under Best Available Control Technology (BACT) determinations at comparable industries. In Massachusetts BACT costs for NO<sub>x</sub> control approach the \$11-13,000 per ton of NO<sub>x</sub> removed/controlled. Furthermore, US EPA's "Proposed Interstate Air Quality Rule" indicates that retrofit installations of SCR technology upon the utility boiler industry costs approximately \$2000-\$2500 per ton of NO<sub>x</sub> removed/controlled (in 1999 dollars). See 69 FR 4565, 4614 (Jan. 30, 2004) (NO<sub>x</sub> control costs for retrofits on existing coal plants). For the utility industry it appears that SCR technology would be considered Reasonably Available Control Technology (RACT) based upon economics. These vendors did not indicate any unusual circumstances that would differentiate the cost for the Greenport plant.



concerned about a phrase it calls an “oblique reference” to a guarantee. This represents a lack of clarity or contracting issue that SLC could follow up on with Alstom. SLC has not responded to Alstom’s 10/20/03 letter.

- performance curves (S.A. at 4-58): SLC concerned curves not provided. However, Alstom’s 10/20/03 letter (at p.2) requested SLC to clarify certain information before Alstom could provide the curves, yet SLC has not responded
- reactor bypass (S.A. at 4-58): SLC is incorrect; Alstom’s 10/20/03 letter (p.2) stated both that a bypass would not be needed and that it would supply one as requested.
- Soot blowers/reactor cleaning (S.A. at 4-59): Alstom’s 10/20/03 letter (pp. 2-3) responded.
- Errata information (S.A. at 4-59): Alstom’s 10/20/03 letter (at p.3) responded.
- SCR reactor space (S.A. at 4-59): because SLC did not respond to Alstom’s 10/20/03 letter, Alstom has not had the opportunity to respond to SLC critique contained in the December 2003 Supplemental Analysis.
- Gas mass flow rate (S.A. at 4-60): though SLC added this to its list of deficiencies, SLC indicates that there is no unresolved issue.
- Temperature range and operation at 300C (S.A. at 4-60 to 61): SLC’s critique is incorrect. The essential issue here is that Alstom’s 10/20/03 letter (at p.3) responded to this issue. To address the issue, Alstom indicated either a heat booster, or if not provided, then a bypass. Alstom made clear enough that its recommendation that no bypass would be necessary was tied to having a heat booster to address the temperature issue.
- NH<sub>3</sub> Consumption values (S.A. at 4-61): we would expect this issue could be clarified between SLC and Alstom. SLC did not respond to Alstom’s 10/20/03 letter to request clarification.
- Sticky deposits (S.A. at 4-61): though SLC requested more information on how to address sticky deposits, Alstom’s 10/20/03 letter indicated clearly stated how Alstom would address this issue.
- Gas distribution and flow straightening (S.A. at 4-62): though SLC added this to its list of deficiencies, SLC indicates that there is no unresolved issue.

- Secondary emissions (S.A. at 4-62): SLC says Alstom's 10/20/03 letter left "open questions" of potentially regulated pollutant formations. However, Alstom stated that its design would not contribute to the present secondary emissions from the plant.
- Pilot plant tests (S.A. at 4-62): Alstom's 10/20/03 letter stated a pilot is not necessary. SLC did not require a pilot as part of its bid specifications.
- Firm pricing (S.A. at 4-63): Alstom's 10/20/03 letter identified Alstom would provide firm pricing. However, lack of contractual certainty between owner and vendor on price is not a LAER issue.
- Specificity of catalyst supplier: (S.A. at 4-63): Alstom's 10/20/03 letter explains its response on this issue, that the catalyst being considered is by Haldor Topsoe, and that it is to SLC's advantage to make final supplier selection at time of the project is initiated.
- Patent (S.A. at 4-63): SLC's questions regarding whether a holder of a patent would need to be a partner, or a license purchased, do not appear to preclude SCR. Vendors are stating that they can supply the catalyst for Greenport. Nonetheless, Alstom's 10/20/03 response stated it would be willing to indemnify SLC.

The issues raised by SLC concerning the vendor information appear resolvable, capable of clarification, and/or are not the type of issues that indicate the technology is not available for controlling NOx to a level far greater than the 40% reduction efficiency expected from SNCR/MSR.

### **SCR At Existing Facilities**

DEP is aware of SCR on the Solnhofen portland cement plant in Germany and is currently investigating a SCR project on a cement plant in Italy. DEP is also familiar with SCR on several existing coal-fired, high dust utilities operating at NOx removal rates of approximately 85 to 90 percent, such as the AES Cayuga facility (New York), AES Milliken facility (New York), and Alleghany facility (2 stations – Harrison and Pleasant) (West Virginia).

KWH's recent direct experience with SCR at the Solnhofen plant has significant bearing on SCR for Greenport and KWH's present willingness to provide SCR guarantees for Greenport. KWH indicated that on February 25, 2004, its management visited the Solnhofen plant and concluded that the

plant has been meeting the limit of 500 mg/Nm<sup>3</sup> NO<sub>x</sub> for 30,000 hours of operation, with an inlet NO<sub>x</sub> rate of roughly 2500 mg/Nm<sup>3</sup>. See KWH 2/27/2004 letter. That represents a NO<sub>x</sub> removal efficiency of roughly 80%. Even more dramatic, this level of NO<sub>x</sub> control has been achieved with only three of the five catalyst layers installed (the extra capacity was designed to achieve a future limit of 200 mg/Nm<sup>3</sup>). This removal efficiency is consistent with the approximately 80% efficiency reported in the article supplied to DEC in Camp, Dresser & McKee's report (on behalf of Friends of the Hudson) dated February 4, 2003, which analyzed inlet/outlet data at Solnhofen. It is also consistent with the 85% NO<sub>x</sub> removal efficiency KWH indicates it would guarantee at Greenport (see above). KWH indicated that more data and information would be available in the near future as it perform bench-scale analysis of the Solnufen catalyst during March 2004. See KWH 2/27/2004 letter. DEP will make this information available to DEC upon obtaining it.

Also, the application of SCR at Solnhofen was a retrofit to the existing cement plant. Generally, we would expect performance of a retrofitted air pollution control technology to be inferior to performance of control technology incorporated into a new source's overall design. Thus, DEP expects an SCR system designed into the new Greenport plant would result in performance advantages over the retrofit at Solnhofen.

#### **SNCR and MSC**

DEP relies largely on the information SLC has supplied concerning SNCR and MSC. SLC acknowledges that the combination of SNCR and MSC at Greenport will be the first in the United States. SLC further acknowledges that the combination of SNCR and MSC at Greenport will be the first in the world to have to comply with strict emission limits.

The Holcin plant in Lagerdorf, Germany incorporates MSC and SNCR for NO<sub>x</sub> control. SLC points to this control system as representing LAER. Initially the plant only used MSC but it could not consistently meet German NO<sub>x</sub> emission limits and MSC was creating some operating difficulties so SNCR was added to further reduce peak NO<sub>x</sub> levels. This scenario is not unlike the Solnhofer plant because both are a retrofit of NO<sub>x</sub> controls on an existing facility and neither had to be optimized to meet the prevailing emission limit. However, SNCR doesn't have the same reduction potential as SCR because

the catalyst enhances the NO<sub>x</sub> to NO<sub>2</sub> conversion. Also, the information SLC provided indicates SNCR at Lagerdorf is maximized to even achieve 40% NO<sub>x</sub> reduction, and in some months averaged over the numerical limit. See S.A. at 3-18 to 19. In contrast, the Solnhofen SCR unit operates with only 3 of 5 beds of catalyst to meet the German emission limit (where 5 beds would achieve a 90 % reduction level).

### **SLC's Legal Arguments**

#### **1. Definition of LAER**

New York defines LAER in part as “[t]he most stringent emission limitation achieved in practice, or which can reasonably be expected to occur in practice for a category of emission sources taking into consideration each air contaminant which must be controlled.” 6 NYCRR 200.1(am). This definition sets out two tests; the most stringent emission limitation of the two will be LAER. If the emission limitation produced by SCR satisfies either one of these tests, and if no other emission limitation is more stringent, then SCR is LAER for Greenport. As set out above under vendor guarantee and SCR use at Solnhofen, SCR’s emission control for NO<sub>x</sub> of approximately 80% appears to have been “achieved in practice” for the portland cement source category. Even using the second part of the LAER definition, SCR is otherwise expected to occur in practice for portland cement plants, including Greenport, based on the same information.

In its Supplemental Analysis, SLC’s statement of the regulatory scheme for determining LAER is inaccurate. See Supplemental Analysis at 5-1 to 5-19. In laying out the definition of LAER, SLC argues (S.A. at 5-3) that where DEC and an applicant have agreed on a LAER limit, an opponent must prove it is unrealistic to expect the technology to perform at the required level, and an ALJ cannot challenge an applicant’s agreed-upon, more restrictive limit. SLC cites *Ramapo Energy*, 2001 N.Y. Env. LEXIS 59, at \*25, for support. However, in *Ramapo* the opponent argued for a less restrictive permit limit than the limit DEC and the applicant had agreed to. The Greenport matter presents the exact opposite scenario: DEP is petitioning for a significantly more restrictive limit on NO<sub>x</sub> emissions than the applicant SLC is so far willing to agree to. Therefore, SLC’s statement of the regulatory scheme is incorrect, and *Ramapo* provides no support for it. For Greenport, since DEP is petitioning for a much more restrictive limit, the essential issue is whether the lower limit is being “achieved” or can “reasonably be expected to occur”. See 6 NYCRR 200.1(am).

## 2. SLC's Arguments: Source Category

SLC argues that the Greenport plant should be in a category of emission sources pretty much all by itself for purposes of the LAER analysis. While SLC may desire such sub-categorization to shield Greenport from the entire first prong of the LAER analysis, especially vis-à-vis Solnhofen, SLC's arguments for state-by-state, case-by-case subcategorization for NSR/LAER are inaccurate.

Pursuant to SLC's application for an air permit, Greenport is categorized as a portland cement plant because the plant will use a kiln to produce clinker and the process exceeds the major source threshold of 100 tons per year. *See* page 3-2 of SLC's air permit application. The Greenport facility will be a portland cement manufacturing plant, one of the 28 listed source categories under PSD. *See for example* EPA's New Source Review Workshop Manual (1990) at A.11, Table A-1 (PSD Source Categories With 100 tpy Major Source Thresholds; "Portland Cement Plants"); *see also* 40 CFR 52.21(b)(1)(iii)(c) and 52.21(i)(4)(vii)(c) (approval and promulgation of state implementation plans; PSD; "portland cement plants" is one source category), 52.24(f)(4)(iii)(c) (nonattainment NSR, "Portland cement plants" is one source category); *also* 40 CFR 60.60 (subpart F)(LAER source category; portland cement plants).

Against this clear backdrop of the portland cement plant source category, SLC argues for state-by-state and case-by-case subcategorization of any source category, and a declaration that Greenport is essentially in a class by itself. SLC's argument if it were to succeed would eliminate the application of the first part of the NY DEC LAER definition ("[t]he most stringent emission limitation achieved in practice") to Greenport. SLC cites no law on point for its sweeping proposal. *See* S.A. at 5-4. Also, SLC's argument would jeopardize the existing benefits of NSR national consistency and the technology-forcing character of the Clean Air Act, by having states across the country determine ad hoc New Source Review/nonattainment source sub-categories for their own state absent any rulemaking.

SLC's subcategory argument rests entirely on a few DEC cases concerning electric generating unit/steam boiler sources, and the MACT program. *See* S.A. at 5-4. However, those arguments fail.

SLC incorrectly argues that the MACT process and standards somehow supply support for SLC's argument for state-by-state ad hoc determinations of LAER source subcategories. *See* S.A. at 5-4 to 5-5. First, NOx at Greenport is a New Source Review/LAER determination, not a MACT issue. So, MACT process and standards are inapplicable, regardless of whether SLC incorrectly sets out the MACT regulatory scheme. Second, for MACT, subcategories are created by rulemaking, as SLC points out (at S.A. 5-5). EPA did promulgate regulations for New Source Review/LAER either creating subcategories for portland cement plants or authorizing states to create ad hoc subcategories. Third, MACT involves a retrofit onto existing facilities, whereas NSR/LAER applies to Greenport because it will be a new plant with emission controls designed into the plant, not retrofitted.

SLC's arguments with respect to electric generating facilities and steam boilers are similarly incorrect. Though EPA has distinguished certain boiler unit sources based on particular criteria, EPA made the distinctions by promulgating the distinctions into law. *See* 40 CFR 60 subparts D, Da, Db and Dc. There is no law authorizing the 50 states to make their own unpromulgated, ad hoc NSR/LAER source categories for these boilers; SLC cited no authority that says otherwise.

SLC asserts that DEC has in the past used factors to subcategorize sources in its LAER determinations. *See* S.A. at 5-6. However, SLC's interpretations of the DEC decisions it cites are inaccurate. All of the cases it cites concern permitting of electrical generating units and steam boilers. For each of these permits DEC applied the source categories EPA had previously promulgated for these sources. The DEC decisions cited by SLC do not use the terminology that SLC claims they say. SLC, in paraphrasing the decisions, generously uses the terms "source category" and "sub-categorization". S.A. at 5-6 and 5-7. However, DEC did not use those terms in its decisions.

SLC cites to *In the Matter of Mirant Bowline*, 2001 N.Y. Env. LEXIS 22, however source category was not an issue in that case. *Mirant* addressed the second part of the LAER test, as the ALJ ruled the "technology is not an alternative technology that could provide an emission limitation reasonably expected to occur in practice." *See Mirant* at \*60. Similarly, SLC inaccurately interprets *Astoria Energy*, 2001 N.Y. PUC Lexis 350, as a source subcategory ruling. In *Astoria*, the ALJ ruled that SCR was LAER, based on whether the asserted lower emission rate was achievable, not on whether a source subcategory should be created. Important to the ALJs' ruling in *Astoria* was that the petitioner

provided no offer of proof to challenge DEC staff's conclusion that petitioner's "emission rate is not achievable".

Other DEC decisions cited by SLC likewise provide no support for its LAER subcategory argument. In *Keyspan Energy* (Part 624 Issues Ruling, April 18, 2001), the petitioner's filing provided that the LAER definition "includes the use of technology that 'can reasonably be expected to occur in practice'". Thus, the ALJ was addressing the second prong of the LAER definition, not whether a source category should be subcategorized. In ruling that SCR represents LAER, the ALJ found petitioner's arguments for SCONOx unpersuasive because petitioner could not show that SCONOx would result in a lower emission rate than SCR: petitioner's own consultant only could say that SCONOx would be "no worse than SCR and it might be better". *Keyspan Energy* at p.7 of 11. In *Kings Park Energy*, 2002 N.Y. Env. LEXIS 29, SLC suggests that operating temperature and fuel incompatibility were the sole basis of the ALJ agreeing with applicant on LAER, and for rejecting petitioner's argument for a SCONOx system. *See* S.A. at 5-6. SLC is incorrect. Significantly, in *Kings Park*, the vendor of the alternative system "identified a higher NOx emission rate with SCONOx than the rate incorporated into the draft permit" thus the SCONOx system would not be capable of achieving an emission limit more stringent than that in the draft permit." *Kings Park* at \*86-87 (emphasis added).

SLC suggests that DEC itself in the *Consolidate Edison* decision created source subcategories for purposes of LAER analysis. *See* S.A. at 5-7 to 5-8. However, the source subcategories for steam boiler are created by EPA through regulation, not by DEC in its case-by-case permitting. *See* 40 CFR 60 (subparts D, Da, Db and Dc).

Finally, SLC argues that a sentence from a SCR catalyst vendor letter is supportive of SLC's source subcategory argument. *See* S.A. at 5-7 ("KWH makes it clear that '[t]he Solnhofen plant cannot be used as a benchmark to extrapolate the SCR catalyst design for the Greenport project"). However, the plain language of the vendor's words address SCR catalyst design for Greenport, and that the design can't be extrapolated from the Solnhofen portland cement plant. The implication is that Greenport would need a custom SCR design, since the design can't be extrapolated (not off the shelf). A need for a facility specific design does not indicate that the facility is its own source category, or that the control

technology will not achieve the emission rates. The plain language does not imply, as SLC claims, that the vendor supports SLC's source subcategory argument.

Under New Source Review (NSR), the Greenport plant should not be a subcategorized source under NSR. SLC has asserted that gas stream characteristics, fuel type, catalyst fouling, production capacity and configuration make the Greenport plant unique among cement plants and therefore should be subcategorized separately from other cement plants including Solnhofer. In the opinion of DEP, SCR is commercially operating at Solnhofer which is a "comparable" cement plant, and operational difficulties posed by the differences at Greenport can be managed. The SLC position seems to imply that in order to be in the same source category for LAER, the technology needs to be proven at a plant that is identical or nearly identical to Greenport. This should not be the case otherwise there would be no advancement of emerging technologies and no enhancement of air quality. Since the essential matter relates to gas stream controls, the regulatory test is whether or not the gas stream from the Greenport plant can be controlled by SCR because the technology is controlling similar gas streams at another cement plant and coal burning plants. At least two of the vendors who responded to the SLC request for proposals (RFP) are of the opinion that the gas streams are similar enough to other applications that they responded affirmatively to the RFP. These vendors do not share SLC's contention that the sulfur oxide concentrations in the Greenport exhaust would preclude the use of SCR.

### **Conclusion**

DEC should engage in the full LAER analysis for NO<sub>x</sub>, including the "achieved in practice" portion of DEC's LAER definition. The vendors DEP contacted believe that SCR can be installed and expected to operate on the Greenport plant. The Solnhofer commercial portland cement plant has been reducing NO<sub>x</sub> emissions via a retro-fit SCR system for the past few years, achieving 80% NO<sub>x</sub> reduction using only 3 of the 5 catalyst beds, based on the vendor's analysis. While SLC may not want to be the first cement plant in the United States to employ this technology on its manufacturing process, this plant could operate for the next 50 years and it ought to reflect the best that today's modern technology can offer in pollution reduction. The technology-forcing character of the laws governing air quality require advancement of the technology, nowhere more so than in New Source Review for non-attainment pollutants/areas. DEP recognizes the need for modern state-of-the-art cement plants to provide critical building materials in the 21<sup>st</sup> century. Requiring advanced state-of-the-art control technology will



further enhance the other significant environmental benefits that would be realized through the replacement of SLC's Catskill plant. We believe that SCR has been demonstrated and the catalyst industry is ready and willing to work with DEC and SLC to advance their technology and further protect the public health and environment.

Thank you again for the opportunity to comment on this important matter.

# State of Connecticut

RICHARD BLUMENTHAL  
ATTORNEY GENERAL



Hartford  
March 18, 2004

Michael Higgins  
New York State Department of Environmental Conservation  
Division of Environmental Permits, Region 4  
1150 North Wescott Road  
Schenectady, New York 12306

Dear Mr. Higgins:

As I have stated on several occasions over the past two years, as the chief civil law enforcement officer for the State of Connecticut, I am strongly opposed to the proposed St. Lawrence Cement Greenport facility (SLC). The facility's air emissions will significantly threaten severe health and environmental harm to countless Connecticut residents already suffering from substantial pollution burdens.

While I have previously written to the New York Department of Environmental Conservation (NYDEC) and the U.S. Environmental Protection Administration (EPA) to comment on SLC's inappropriate Best Available Control Technology (BACT) and Lowest Achievable Emissions Rate (LAER) analysis, I now write to address a December 2003 submittal by SLC that was initiated per the NYDEC request for a more detailed analysis of selective catalytic reduction technology (SCR).

Despite SLC's lengthy submission, SLC failed to apply the appropriate nitrogen oxide (NOx) LAER analysis to reflect the most recent information available on NOx emission control technology for cement plants. What SLC has done is to invent a rigid bid scenario for SCR vendors, with specifications and guarantees set so high that it appears that the goal was to ensure that all vendor proposals would fail. For instance, SLC apparently has set a 90% capture control efficiency within 180 days of installation as part of its bid specifications, while it appears that only a 40% efficiency after two years is now set as a guarantee for the selective non-catalytic reduction (SNCR) technique. As noted in the attached Connecticut Department of Environmental Protection (CTDEP) analysis by Jude Catalano dated March 1, 2004, CTDEP notes that in particular, the financial commitments required of the vendors, installation/performance timing issues, and some of the stack gas exit limits appear to be unreasonable specifications. There is persuasive reason to believe that SLC has inappropriately rejected certain vendors' responses for the SCR technology.

Michael Higgins  
March 18, 2004  
Page Two

SLC has also ignored and excluded information necessary to proper analysis. As explained in the CTDEP memorandum, while SLC emphasizes that the gas stream composition of the Solnhofen facility differs from the Greenport expected gas stream composition, it neglects to include detailed gas stream data of the Solnhofen facility or to include data on the reliability of the SCR system at Solnhofen. On this matter, CTDEP has been in communication with KWH Catalysts, Inc. (KWH), one of the companies which submitted a proposal to SLC, and was informed that KWH has now received pertinent performance data from the Solnhofen facility, enabling it to provide performance guarantees without the need to require pilot testing. SLC should assess its NOx LAER analysis using this available data. CTDEP is also concerned that SLC simply rejected the proposal from Alstom Power, without giving due consideration to its apparently reasonable offer. In light of the information in the CTDEP memorandum, SCR may no longer be dismissed as an innovative unproven technology for cement kiln applications and therefore should not be discounted as a viable NOx LAER technology.

A careful and critical review of SLC's comments -- which I urge you to undertake -- will lead to the conclusion that this plant violates both environmental standards and public policy. Any and all achievable reductions in all pollutants, including NOx, which will be emitted by SLC and transported to Connecticut, must be required by the DEC and EPA to comply with the Clean Air Act.

There is simply no possible justification for approval of this plant.

Very truly yours,



RICHARD BLUMENTHAL

cc: Arthur J. Rocque, CTDEP  
Jane Stahl, CTDEP  
Hon. Christopher J. Dodd  
Mitchell L. Gaynor, M.D.  
Wilmer J. Thomas, Jr.  
Sam Pratt, FOH  
Hon. H. Goldberger, ALJ  
Jane M. Kenny, U.S EPA  
Steven C. Riva, U.S EPA  
Walter Mugdan, U.S EPA

## MEMORANDUM

**TO:** David Wackter  
Supervising Air Pollution Control Engineer

**FROM:** Jude Catalano  
APCE III

**DATE:** March 1, 2003

**SUBJECT:** Preliminary review of the updated NO<sub>x</sub> LAER analysis for the proposed Saint Lawrence Cement (SLC) facility in Greenport, New York.

As you know, the Saint Lawrence Cement Company (SLC) has proposed to construct and operate a new dry process cement manufacturing facility capable of producing approximately 2.5 million tons of cement clinker annually in the town of Greenport, NY. SLC is seeking a federal PSD permit from the New York Department of Environmental Conservation (NYDEC), which has authority to administer the federal PSD permit program. This memorandum is a follow-up to my August 5, 2003 memorandum to you, which expressed concern with the draft permit NO<sub>x</sub> LAER limit based on Selective Non-Catalytic Reduction (SNCR) technology.

On July 29, 2003 NYDEC notified SLC that they must update their NO<sub>x</sub> LAER analysis to reflect the most recent information available on NO<sub>x</sub> emission control technology for the cement manufacturing industry. NYDEC specifically requested that SLC include an updated evaluation of Selective Catalytic Reduction (SCR) technology and its use at a cement clinker manufacturing facility in Solnhofen, Germany. NYDEC also requested an evaluation of the latest advancements in Multi-Stage Combustion (MSC) and Selective Non-Catalytic Reduction (SNCR) technologies for the cement industry.

In December 2003, SLC submitted their updated NO<sub>x</sub> LAER analysis in a report entitled "St. Lawrence Cement Greenport Project SLC Hudson Valley Operation Lowest Achievable Emission Rate Supplemental Analysis" to the NYDEC. The report concludes that emission limitations based on MSC and SNCR technology is LAER for the Greenport project. The actual LAER limit in the permit is to be set at 3.6-lbs NO<sub>x</sub>/ton clinker upon start-up and then ratcheted down in some way over the following two years to a maximum of 2.9-lb NO<sub>x</sub>/ton of clinker to reflect an achievable NO<sub>x</sub> control efficiency of the SNCR add-on control, which is unknown at this time. The SLC LAER analysis rejects SCR NO<sub>x</sub> control on two counts: (1) SCR is not being achieved in practice primarily because the dry process cement clinker manufacturing facility in Solnhofen, Germany, is not in the same source category as the dry process cement clinker manufacturing facility proposed for Greenport, and (2) SCR and its resultant emission limit cannot reasonably be expected to occur at the different source category that would be the Greenport facility.

In their report, SLC presents a detailed discussion on potential problems with an SCR NO<sub>x</sub> control installation. These problems include catalyst deactivation caused primarily by "poisoning" of the catalyst by some of the chemical compounds in the gas stream, "surface plugging" or "fouling" of the catalyst caused by particulate matter in the gas stream, "erosion" of the catalyst structure again due to its exposure to high dust levels, "pour plugging" or "masking" of the catalyst caused by particle deposition and subsequent chemical reactions, and "thermal sintering" which results in the permanent reduction of catalyst performance due to its exposure to higher than desired gas stream temperatures. These problems are discussed in detail vis a vis the

chemical, thermal and particle composition expected in the proposed Greenport gas stream. SLC concludes that a SCR system at the Greenport facility could not work mainly due to the composition of the gas stream expected at Greenport. SLC further concludes that an SCR installation at Greenport would either, perform at unacceptable levels operationally and environmentally, or end with catastrophic failure of the catalyst.

In their above cited report, SLC emphasizes that the gas stream composition of the Solnhofen facility is much different than that expected at Greenport, particularly in regards to sulfur levels (which are expected to be as much as 300 times higher at Greenport), particulate levels and to a lesser extent alkali levels and minimum expected gas stream temperatures. The differences in the composition of the gas streams at the two facilities are primarily due to the differences in the chemical composition of the raw materials used to manufacture the clinker according to SLC. These gas stream differences are the justification behind the SLC conclusion that SCR has not been achieved in practice for their source category. This may be a reasonable opinion however no detailed gas stream data from the Solnhofen facility is presented to help validate their conclusion.

In the end, the question of whether Greenport and Solnhofen are in the same source category is somewhat irrelevant. The real issue is whether or not an SCR installation can reasonably be expected to occur in practice (operate successfully) at Greenport. On this point the conclusion in the SLC report that a SCR system would fail at Greenport is, at best, speculative.

SLC concludes that the SCR installation at Solnhofen could not be adapted to successfully control the Greenport gas stream. No detailed data on the actual composition of the Solnhofen gas stream and no data on the reliability or performance of the SCR system at Solnhofen are presented in the SLC report. This is a critical shortcoming. Therefore, the question of "reasonably expected to occur in practice" needs to be answered by way of guarantees from potential suppliers with significant SCR installation experience.

A bid specification for an SCR system at Greenport was sent by SLC to four potential suppliers: Babco & Wilcox, Lurgi, PSI (the U.S. arm of the German engineering firm involved in the construction of the SCR demonstration project at Solnhofen), Alstom Power, and KWH Catalysts, Inc. (the supplier of the catalyst at the Solnhofen facility). Of the four suppliers, KWH and Alstom Power responded with detailed comprehensive bids. Babco & Wilcox and Lurgi declined to supply a bid.

KWH submitted a detailed non-firm bid proposal. The KWH bid reflects the ability of the company to supply a SCR system for Greenport that would meet all SCR performance requirements specified in the SLC bid specifications, except perhaps for the requirements regarding certain monetary refund guarantees. KWH recommends that, since this would be the first SCR installation on a cement plant in North America, a SCR installation pilot project be undertaken on a similar SLC cement kiln for the purpose of working out technical design issues. This slipstream pilot demonstration would then be followed by a full-scale design and installation at Greenport. KWH believes this approach, which was used at Solnhofen, would ensure success for the project with minimal risk to all parties. SLC interprets this approach as proof that SCR has not been achieved in practice for their source type and that SCR should be considered an innovative technology, a valid conclusion based on the KWH recommendation.

On February 25, 2004 I received e-mail from Tom Lugar CEO of KWH stating that on 2/25/04 KWH now had the performance data available from the Solnhofen facility to provide performance guarantees (assuming commercial terms are industry standard) without the need to

require pilot plant testing. SLC, NYDEC and EPA Region II should pursue this latest commitment by KWH before any NOx LAER determinations become final.

Alstom Power's proposal and response to SLC concerns seem to satisfy most of the bid specifications. SLC's rejection of the Alstom bid is discussed in their report. SLC gives what amounts to a non-cooperative hand waving rejection of what appears to be a very serious and potentially viable offer from Alstom. A more detailed review of both the Alstom bid and SLC concerns should be performed, however that is beyond the scope of this memorandum. The permitting authority, NYDEC and EPA Region II, should require that additional effort be made, on the part of SLC and Alstom, to develop an SCR system proposal for Greenport that could be acceptable to both parties.

In summary, both the KWH and Alstom offers seem serious and are backed up with extensive experience on a wide variety of SCR applications with gas streams similar in many ways to, if not exactly like, that expected at Greenport. Both Alstom and now perhaps KWH do not see the need for a pilot demonstration. Therefore, SCR may not be considered an innovative technology for cement kiln applications. The permitting authorities involved should require further development of both the KWH and Alstom offers. The bid specifications developed by SLC should also be scrutinized because some of these specifications appear unreasonable, particularly the financial commitments required of the vendors, installation/performance timing issues, and some of the stack gas exit limits.

#### References:

1. Re: Response to Saint Lawrence Cement (SLC) request for proposal, e-mail from Tom Lugar, KWH Catalysts, Inc. to Jude Catalano, Connecticut Department of Environmental Protection, February 25, 2004.
2. St. Lawrence Cement Greenport Project SLC Hudson Valley Operation Lowest Achievable Emission Rate Supplemental Analysis, Saint Lawrence Cement, 4303 Route 9 Hudson, NY 12534, December, 2003.
3. Saint Lawrence Cement Greenport Project Hudson Valley Operation Air Permit Application: Chapter 6, NSR/LAER Determination, April 27, 2001.

cc: C. James



## KWH Catalysts, Inc.

February 27, 2004

Camp Dresser & McKee Inc.  
One Cambridge Place  
50 Hampshire Street  
Cambridge, MA 02139

Attention: Frank Sapienza  
Principle Engineer

Subject: SCR System for St. Lawrence Cement  
KWH Catalysts, Inc. Response to Revisions to the Specification

Dear Mr. Sapienza:

The following is response to your questions concerning the proposed CDM revisions to the St. Lawrence Cement Greenport SCR bid specification.

1. Can KWH Catalysts, Inc. guarantee that its proposed SCR system for St. Lawrence Cement will meet the performance guarantees as stated in Appendix 1?

### **NO<sub>x</sub> Reduction Efficiency**

KWH can meet the performance guarantee of a minimum 85% NO<sub>x</sub> reduction. However, the minimum temperature to the SCR must be 315 C versus the specified 300 C to avoid salt formation. The temperature at which ammonium salts will begin to form is really not a debatable issue. With ammonia present and the concentration of SO<sub>3</sub> and NO<sub>x</sub> known, salts will begin to form at a temperature dependent on the moisture content of the process gas. This is well known chemistry and easily calculated.

### **NH<sub>3</sub> Slip**

KWH can meet the performance guarantee requirement of not to exceed 2 ppmvd at 3% O<sub>2</sub>.

### **SO<sub>2</sub> Oxidation**

The requirement of SO<sub>2</sub>/SO<sub>3</sub> conversion of less than 1% by mole is the now typical requirement in specifications for coal-fired U.S. utility boilers since potential carry-over of SO<sub>3</sub> downstream can result in an acid plume out the stack. This criteria should not be applied to a cement process gas stream. The SO<sub>3</sub> generated in the

KWH Catalysts, Inc. • 435 Devon Park Drive • 400 Building • Wayne, PA 19087  
Phone: (610) - 293 2507(2508) • Fax: (610) - 254 9617  
[www.kwhcatalysts.com](http://www.kwhcatalysts.com)



process is captured by the large amount of free lime as CaO in the gas stream. SO<sub>2</sub> oxidation by the catalyst will have no negative impact on the amount of SO<sub>3</sub> formed and subsequently captured. As an added point, there is no field test method that can measure this anyway since the SO<sub>3</sub> gas is totally captured by conversion to particulate calcium sulfates and sulfites as it is contacted by the free lime upstream, within, and downstream of the SCR catalyst.

#### **Gas-Side Pressure Loss**

KWH can meet the performance guarantee requirement of not to exceed 6" W.G. across the flange-to-flange SCR system.

#### **Turndown Requirements**

KWH will maintain all performance requirements listed in the Appendix with the exception of SO<sub>2</sub> oxidation (as explained above) within the ranges of flow and characteristics defined in Item 1 of your letter. However the minimum temperature must be 315 C versus the specified 300 C.

#### **Catalyst Life**

Common practice for SCR catalyst is 16,000 hours and KWH would guarantee this catalyst lifetime. The Solnhofen SCR has operated successfully for over 24,000 hours. In three weeks KWH will be removing catalyst test elements from the Solnhofen reactor and conducting laboratory bench reactor tests to determine catalyst deactivation. KWH stated in its bid to St. Lawrence that it expected a 24,000 hour catalyst life. KWH would be willing to provide a 24,000 hour life guarantee but this commitment would be depend on the results of these bench reactor catalyst tests. KWH will update you on this issue when the bench reactor catalyst test results become available. A condition for the catalyst life guarantee and the following Availability guarantee is that the SCR system be equipped with a 100% bypass. This will protect the catalyst against plant upset conditions such as very low gas flow that would plug the catalyst quickly or moisture conditions at acid or water dewpoints that would form cement at the catalyst face and in the catalyst channels effectively ending the life of the catalyst. This is not an unreasonable condition as this is common practice for some pollution control equipment that are sensitive to specific plant upset conditions. For example, a bypass is commonly used for baghouses to prevent high temperature excursions from destroying the filter bags or boiler tube leaks causing permanent bag blinding.

#### **SCR Availability**

KWH can guarantee SCR system availability of 98% of the time that the cement plant is operated at stable, continuous conditions as defined in the specification for the performance guarantee criteria and provided that the SCR system is maintained and operated in accordance with the procedures and instructions stated in the KWH Operations and Maintenance Manual. Additional conditions for the availability





guarantee are that KWH will have access to the SCR system during plant outages and forced shut-downs to conduct inspections and maintenance of the SCR system and that the SCR system is equipped with a 100% bypass as described previously.

**Failure to Meet Performance Guarantees**

KWH takes exception to the open-ended liquidated damages requirement as stated. The Industry standard for pollution control systems, be they FGD scrubbers, bag-houses, SCRs and precipitators is typically worded as follows: "The cumulative maximum liability of Vendor with respect to all claims and costs arising out of or incurred in connection with this contract or arising out of the performance or non-performance of the supplied scope of work, whether based on contract, warranty, tort, strict liability or otherwise, shall not exceed in the aggregate an amount equal to one hundred (100%) percent of the Contract Price paid to Vendor".

**2. Maintaining the Minimum Temperature**

The inclusion, as you propose, of a bypass duct around the last preheater cyclone as a method to maintain the preheater tower exhaust gas above the minimum required temperature of 315 C, appears to be a reasonable method to address the minimum temperature issue.

**3. Solnhofen Plant Data**

KWH had a very informative meeting at the Solnhofen Plant on February 25. The SCR has been operating for over 24,000 hours and maintaining the German regulation requirement of not to exceed 500 mg/m<sup>3</sup> of NO<sub>x</sub>. The SCR is only equipped with 3 of a possible 5 layers to meet the 500 mg limit. Provision was included in the SCR design to achieve potential future limit of 200 mg. The 500 mg requirement is being achieved with an average NO<sub>x</sub> inlet of 2500 mg.

During the KWH meeting, Mr. Gerd Sauter, Plant Manager, stated that, if CDM wishes to obtain detailed SCR performance data and process exhaust gas and particulate/raw feed data, he would be pleased to provide this information with a confidentiality agreement in place. He invited CDM to visit the plant if they wish.

As a final comment, note that SCR technology has been applied for several decades to a diverse number of applications worldwide. KWH, in particular, has successfully applied its catalyst technology to such applications as coal-fired boilers, oil and gas fired boilers, municipal waste and sewage sludge incinerators, diesel/gas cogen plants, chemical plants, refineries, glass plants, biomass incinerators, and steel sinter plants. These applications span an extreme range of process gas/dust conditions and operating conditions. SCR catalyst is a mature, proven technology that can be adapted in its design formulation and configuration (i.e. pitch, length, etc.) to a wide range of applications as has been shown with the new application on cement at Solnhofen.



## **KWH Catalysts, Inc.**

Should you have questions or require additional information, please contact me.

Very truly yours,

Tom Lugar  
Chief Executive Officer  
KWH Catalysts, Inc.

## **1.0 Introduction**

### **1.1 Purpose of this Submission and Executive Summary**

Friends of Hudson (FOH) has asked its engineering consultant, Camp, Dresser & McKee (CDM), and its attorneys Young, Sommer, Ward, Ritzenberg, Baker & Moore, LLC, to prepare this submission in response to a report submitted by St. Lawrence Cement, LLC (SLC) entitled *St. Lawrence Cement Greenport Project, SLC Hudson Valley Operation, Lowest Achievable Emission Rate Supplemental Analysis* (hereinafter “SLC Supplemental LAER Analysis”). The SLC report purports to update the lowest achievable emission rate (LAER) analysis previously prepared by SLC addressing the control of emissions of nitrogen oxides (NO<sub>x</sub>) from SLC’s proposed cement plant in Greenport, New York (the “SLC project” or “Greenport project or facility”). SLC’s earlier analysis concluded that a combination of multi-stage combustion (MSC) and selective non-catalytic reduction (SNCR) constitutes LAER for the facility; this determination was reflected in the draft permit prepared by the New York State Department of Environmental Conservation (DEC) and made available for public review in 2001. In the wake of recent developments in pollution control technology and information supplied to DEC by FOH, DEC requested that SLC review this determination, focusing specifically on the feasibility of using selective catalytic reduction (SCR) as an alternative to MSC and SNCR for purposes of establishing NO<sub>x</sub> LAER.

In summary, SLC’s Supplemental LAER Analysis represents a continuation of SLC’s past practice of providing deceiving information with respect to the state of current technological developments concerning SCR. SLC has grossly understated the NO<sub>x</sub> removal efficiency of the Solnhofen plant, claiming that the NO<sub>x</sub> reduction from SCR was only 40% when in fact the reduction was 82%. SLC submitted a package of bid

specifications to various vendors that was designed to get a negative response and made no effort to work with those vendors who expressed an interest in supplying SCR to the Greenport project. In response to a more realistic bid package prepared by CDM, at least one vendor, KWH who supplied the catalyst to Solnhofen, has stated that it can supply a system to the Greenport project and can guarantee an 85% NO<sub>x</sub> removal. SLC's supposed technical analysis of problems associated with SCR is unsupported, and, more importantly, must be contrasted with SLC's preferred technology of SNCR and MSC, which it admits have never been applied together on a large scale cement plant in the United States. Finally, SLC compounds its technical misrepresentations by providing a legal analysis that does not reflect the requirements of the Clean Air Act; in addition, SLC's lawyers continue their shameless practice of citing legal authority for propositions that the cases do not support.

As set forth in greater detail below, under New York's nonattainment new source review (NSR) law, LAER is defined as "the most stringent emission limitation achieved in practice or which reasonably can be expected to occur in practice for a category of emission sources." 6 NYCRR § 200.1(ak). Although the thread of SLC's Supplemental LAER Analysis is sometimes difficult to follow, the following appear to be SLC's core arguments:

- (1) The application of SCR to the Greenport cement plant is infeasible because of various insurmountable technical obstacles, including catalyst poisoning, catalyst plugging and fouling, sulfur dioxide (SO<sub>2</sub>) oxidation, gas temperature issues, NO<sub>x</sub> variability and ammonia slip, undesirable byproduct formation, process start-up, shutdown and malfunction issues, and gas flow distribution concerns.
- (2) The successful application of SCR at other facilities, including dozens of coal and oil-fired power plants as well as a cement manufacturing plant in Germany (the "Solnhofen facility"), is not evidence that the technology is feasible because these facilities are "different" from the Greenport plant in ways that make successful

application of SCR impossible.

- (3) SLC's unsuccessful attempt to obtain a firm bid from vendors to supply an SCR system to the Greenport project shows that SCR is not commercially available.
- (4) The application of SCR would not achieve NO<sub>x</sub> emission reductions greater than those achieved using MSC and SNCR, making pursuit of this "risky" control option pointless.

According to SLC, these factors, taken together, show that SCR has neither been "achieved in practice" nor can it "reasonably be expected to occur in practice" for cement kilns similar to the Greenport plant.

SLC's analysis of the technical and legal obstacles to requiring the Greenport plant to install SCR is wrong and should be rejected.

- (1) **Application of SCR to the Greenport Plant is Technically Feasible.** The various technical obstacles to application of SCR identified by SLC all have been resolved at other installations, are not as critical as SLC claims, and/or are correctable with slight process modifications. Specific examples are summarized briefly below:
  - (a) *Catalyst poisoning.* Various coal-fired plants have successfully used SCR despite concentrations of various catalyst poisons higher than those expected at Greenport. Oil-fired boilers are operating using SCR despite the presence of water soluble flyash, suggesting that the alkali in the cement kiln flyash is unlikely to deactivate the catalyst, contrary to SLC's suggestion. *See* Section 4.2.2.1 below.
  - (b) *Catalyst plugging and fouling.* The Solnhofen facility operates at a dust loading of 80 g/Nm<sup>3</sup>, 20 grams *higher* than the average dust loading anticipated for Greenport. The "sticky deposits" identified by SLC as a possible plugging concern appear to be unrelated to operation of the SCR system. *See* Section 4.2.2.2 below.
  - (c) *SO<sub>2</sub> oxidation.* The presence of high SO<sub>3</sub> concentrations has not led to catalyst deactivation and other problems at facilities with high calcium and high sulfur flue gases such as those likely to be found at Greenport (as evidenced by the experience at various coal-fired power plants and by

representations from various SCR suppliers). The formation of ammonium salts can be prevented by maintaining SCR inlet temperature at an appropriate level. *See* Section 4.3 below.

- (d) *Gas temperature ranges, distribution and fluctuation.* To operate effectively, the inlet temperature to the SCR must be within a certain range, with minimum fluctuations. This need can be met by installing a bypass duct around the last preheater cyclone. *See* Section 4.4 below.
- (e) *NOx inlet concentrations and ammonia slip.* The reservoir of unused ammonia on the surface of the catalyst bed enables SCR systems to handle sudden peaks in inlet NOx concentrations, thereby minimizing ammonia slip. SNCR systems, by comparison, are prone to ammonia slip because they must constantly respond to changes in NOx levels by changing ammonia feed rates. Both coal-fired boilers and the Solnhofen plant have been operating successfully despite apparent NOx inlet variability. *See* Section 4.5 below.

*See* Section 4.0 for a complete analysis/rebuttal of SLC's arguments against installing SCR at the Greenport plant.

- (2) **The “Differences” Between the Greenport Plant and Other Facilities Do Not Preclude the Successful Application of SCR.** SLC's argument against SCR is premised on the notion that the Greenport plant is so different from existing facilities equipped with SCR that SCR will not work. This notion is implicit in its discussion of technical feasibility in Section 4.0 of the Supplemental LAER Analysis; it also underlies SLC's argument that SCR does not constitute LAER as that term is defined in New York's nonattainment NSR regulations. In Section 5.0, SLC goes to great lengths to argue that the Solnhofen cement plant and the proposed Greenport cement plant are not in the same “source category” and that, as a result, LAER cannot be said to have been “achieved” for that source category. SLC also argues that differences between the Greenport project and both existing coal-fired boilers and the Solnhofen plant preclude successful technology transfer. The arguments in Section 5.0, although framed in legal terms, amount to nothing more than further arguments that LAER is not technically feasible for the Greenport plant. The purported “differences” identified between the Greenport plant and other facilities that are successfully operating SCR systems are not significant and/or can readily be addressed in the design and operation of the system.
- (3) **SCR Systems are Commercially Available for the Greenport Project.** SLC

sought bids from four SCR suppliers; two suppliers declined to bid and two suppliers submitted bids deemed “unsatisfactory” by SLC, leading SLC to conclude that SCR systems are not commercially available for the project. As discussed in Section 4.10 below, the bid specifications submitted by SLC were so stringent they virtually guaranteed that no supplier would bid successfully. The bid process also was designed to discourage suppliers from working with SLC to resolve potential technical or other obstacles to preparing a satisfactory proposal. When CDM submitted its own, more realistic bid specifications to SCR suppliers, it received one positive response; had SLC submitted a more realistic bid specification and shown a willingness to work with suppliers, its success rate would likely have been even higher. Thus, contrary to SLC’s assertions, SCR systems are commercially available for the Greenport project provided SLC is willing to work with suppliers to ensure successful design and operation.

- (4) **SCR Would Achieve Higher NOx Reductions than MSC and SNCR.** SLC argues that the Solnhofen plant’s SCR system is only achieving a 40% reduction in NOx emissions, a level comparable to that expected for Greenport using MSC and SNCR. As a result, they argue that there is no good reason to assume the risks associated with SCR. However, SLC has miscalculated the NOx reductions being achieved at Solnhofen; in fact, Solnhofen is achieving 82% NOx emission reductions using SCR, more than twice the level expected using MSC and SNCR. Assuming comparable rates of reduction are achieved at Greenport, the facility would emit only 1,729 tons per year of NOx using SCR (as compared to 3,718 tons with MSC and SNCR).

In light of these facts, DEC should reconsider its decision to require MSC and SNCR as LAER for the Greenport project and should instead require SLC to install SCR to ensure that the project meets the “lowest achievable emission rate.” SCR has already been successfully used at one cement plant and has a long history of success on other types of facilities, including dozens of coal and oil-fired power plants. Although SLC will have to work closely with the SCR supplier to ensure that the system is designed to address the particular circumstances at the Greenport plant, there is no reason to believe that comparable NOx reductions cannot be achieved at Greenport.

Recd 3/29/04  
KIM



MISSISSIPPI  
LIME

Discovering what's possible with calcium

16147 Hwy. 61 • Ste. Genevieve, MO 63670  
(573) 883-5731 • Fax (573) 883-4101

March 29, 2004

Ms. Leanne Tippetts – Staff Dir.  
Missouri Department of Natural Resources  
205 Jefferson  
Jefferson City, MO 65101

Dear Ms. Tippetts:

This letter is written in response to the Missouri Department of Natural Resource's request for comments on the draft PSD Permit for Holcim's Lee Island Cement Plant. I have reviewed the draft permit and believe the MDNR has done a commendable job in balancing the interests of all parties involved. Most importantly, I believe that MDNR has established the appropriate requirements to fully protect the air quality of the State of Missouri and in particular the St. Louis metropolitan area.

On behalf of Mississippi Lime, I offer our support for the issuance of this permit. However, there is one concern with specific provisions of the permit on which we would like to comment. I realize that permits must be written to take into account site-specific concerns; however, there are specific conditions of the permit that attempt to include pre-existing regulatory requirements by paraphrasing those regulations in the permit. For example, the requirements of the Portland Cement MACT are included by summarizing them within several conditions in the permit. In addition, conditions when a construction permit is required are defined. These provisions are ill advised because they create potential conflicts with the regulation. They are superfluous as the company must comply with them regardless of their presence as a condition in the permit. Therefore they are neither necessary nor appropriate and we recommend they be removed.

I sincerely appreciate this opportunity to comment.

Sincerely,

Thomas E. Siedhoff, P.E.  
Director, Environmental Health and Safety



March 29, 2004

Ms. Leanne Tippet  
Director, Air Pollution Control Program  
Missouri Department of Natural Resources  
P.O. Box 176  
Jefferson City, MO 65102-0176

**RE: Public Notice of Holcim (US) Inc. – Lee Island Project permit. Project number 2000-05-077.**

Dear Ms. Tippet:

Chemical Lime Company (CLC) has reviewed the above-referenced public notice draft permit and offers the following comment for your consideration:

*Project Review of Application For Permit to Construct, BACT Review, Eliminate the Technically Infeasible Options (page 26 of 79).*

Chemical Lime Company concurs with the statement “Fabric filters are infeasible for the coal handling sources (emission points 109 through 114) due to safety considerations (explosion hazard).” Coal by nature is combustible, and fabric filter dust collectors do not remove all of the coal dust from the bags through regular cleaning. The coal that is retained on the bags can exhibit low enough ignition points to self-combust and/or explode under certain operating conditions.

Chemical Lime Company appreciates the opportunity to comment on this public notice draft permit. Should you have any questions about our comment, please contact me or Schuyler Johnson of my staff at (573) 883-3001.

Sincerely,



Keith W. Huck  
Plant Manager



Fax  
Received  
RECEIVED 3/29/04

2004 MAR 31 AM 11:11

AIR POLLUTION  
CONTROL PCN

## OFFICE OF THE ATTORNEY GENERAL

STATE OF ILLINOIS

March 29, 2004

**Lisa Madigan**

ATTORNEY GENERAL

Ms. Leanne Tippet

Director

Air Pollution Control Program

Missouri Department of Natural Resources

P.O. Box 176

Jefferson City, MO 65102-0176

Re: Holcim (US) Inc. Lee Island Project

Dear Director Tippet:

Lisa Madigan, Attorney General of the State of Illinois submits the following comments regarding the proposed Prevention of Significant Deterioration Permit Application for the above-referenced facility. Thank you for the opportunity to submit comments. We commend the Department and the Company for all of the effort expended to assure that emissions from the facility will comply with Missouri's air pollution standards and will not further degrade air quality in Illinois. These comments are intended to assist in your achieving that goal.

The proposed determination relies on forecasts of what emissions will be and the corresponding results on air quality but does not describe what measures will be required to verify those projections accurately forecasted the emissions and their impacts? Will there be such requirements included in the permit? Are they required by regulation or statute? What mechanisms are in place to respond to greater than projected air quality impacts?

Similarly, the authorization of SNCR as an Innovative Control Technology anticipates reductions in emissions but the permit does not require confirmation of that forecast. What monitoring is required to verify the reductions? Under what conditions can SNCR as ICT be discontinued and would any controls be substituted for it?

The determination also states that

"SNCR will be operated continuously, but will undoubtedly be less effective during certain atmospheric and processing conditions. Avoiding the violation of other state and federal requirements will be part of the operational procedures to be developed during the testing and evaluation phase.

Are the possible opacity violations mentioned in the preceding portion of the evaluation the only "violation of other state and federal requirements" at issue? Is there a limit on the number or extent of violations that are allowed to occur during the testing and evaluation phase? Will operational procedures be developed to identify processing conditions which will maximize effectiveness?

The proposed determination also relies on retirement of emission reduction credits to be acquired from Solutia.. What effect will Solutia's bankruptcy have on the availability of those credits? What will be the impact if those credits become unavailable?

In the BACT Analysis for Nox, the Department found that Selective Catalytic Reduction, was technically infeasible, in part, because "the cement kiln gas stream has a high degree of fluctuation, both short and long-term." What is the source and nature of this fluctuation? Was this fluctuation accounted for in the evaluation of the other technologies? If not, how will such fluctuations affect achieving the specified emission limits and will those impacts be monitored? The BACT analysis also did not delineate why Low-Nox burners were not considered to be the "Top" control technology.

With regard to impacts from Mercury emissions, has there been an evaluation of whether the projected emissions will lead to an increase in the issuance of health based fish advisories in Illinois? The Environmental Assessment prepared by the U.S. Army Corps of Engineers for the facility's 404 permit concluded that the projected increase would not adversely impact fish in the Mississippi River because of the wide gap between the existing value for mercury present in fish and the threshold used by the State of Missouri for issuance of health based fish advisories. The gap may be substantially smaller for a number of waterbodies in Illinois. Several waterbodies within the downwind range of plant emissions are the subject of health based advisories for several fish species and a small increase could lead to the expansion of the advisory to other species.

The proposed permit reflects a significant effort by the Department and the applicant to balance the project's impact on the environment and the economic development the project will bring. The issues identified above need to be addressed to assure that the proposed permit will satisfy the applicant's goal of operating a facility that will protect the environment in Missouri and Illinois.

If you have any questions, please call me at 217-524-7506.

Very truly yours,

James L. Morgan  
Senior Assistant Attorney General

JM:jm

cc: Illinois EPA



"Diana Oleskevich  
csja"  
<doleskevich@csjso  
rg>

To: randy.raymond@dnr.mo.gov  
cc:  
Subject: Holcim comments

03/29/2004 09:42 AM

My name is Diana Oleskevich. I hold a master's degree in Public Health from St. Louis University. I am a wife, mother and grandmother. I currently work as Justice Coordinator with the Sisters of St. Joseph of Carondelet.

Because of all of our children and grandchildren, because of the health of all people and animals and even the plants, I am strongly opposed to the DNR draft permit for Holcim Cement Plant being built.

Our daughter, Katie has asthma, as do our granddaughters. The Holcim draft permit allows more nitrogen oxides emissions than all other sources combined in St. Gen county – I understand that it would cost Holcim more to use Selective Catalytic Reduction technology and erode some of their profits – Let's put people before profits, especially the children who have asthma. Holcim is NOT using best available technology here! Why can Germany use SCR and Missouri is denied? Our two granddaughters, Brittany and Meredith will suffer from polluted air because their asthma will be irritated – so will every child's health be compromised!

Last week there was a hearing in Marissa, IL – only 30 miles away – the EPA is allowing a proposed Peabody plant to emit 25,000 TONS of particulate matter to pollute the air around our city, which is not such a "fair air" city these days – Holcim's emissions will jeopardize the progress of the Air Quality Control Region. Children will again be affected, and those who are elderly as well. The St. Louis Region is already in violation of the new air quality standards for ozone and fine particulate matter.

Why didn't DNR require Holcim to assess the facility's impact on the Region's ability to achieve the new air quality standard for fine particulate matter?

Again – this is big business and corporate profits eroding the health of people. I think the DNR – Department of Natural Resources is failing us at this time!

The proposed plant will also undoubtedly affect Mingo Wildlife Refuge and every river, creek and stream.

What could be more fun than a fishing outing with grandchildren? I am unable to allow our grandchildren to eat fish they catch because of mercury levels. The DNR permit does not require Holcim to use any mercury reducing technology. They will be emitting 160# of mercury every year – when only a tablespoon can pollute a sizeable lake, - this is appalling. You know what mercury poisoning can do – limit cognitive ability, cause tremors and convulsions. When can our children begin to fish and enjoy their catch??

This is again big business interfering with ecology and health.

I understand that in the building of this proposed plant, some 1,000 jobs will be temporarily created, and that in the running of this polluting cement plant, some 200 people will get permanent jobs. How many will come from other parts of the country, from Switzerland and around the globe?

Don't let Holcim fool you – this is a global company, and not many permanent well-paying jobs will be filled from this area!

While recognizing the desire for economic growth, I know that the ultimate economic benefit will not outweigh the burden and costs of bad health for our community, lousy air quality and detrimental pollution of waters, air and land with nitrous oxide, particulate matter and mercury.

The Sisters of St. Joseph hold a strong belief that all of life and creation are sacred. This motivates us with an urgent concern for Earth, our home. You cannot have healthy people on a sick and polluted planet! Survival of the life systems of Earth is threatened due to the destructive aspects of specific human behaviors – including the Holcim plant. We recognize that those who are economically poor are affected most immediately and intensely by this crisis.

We will continue to join with others in working for systemic changes that will enable ALL to live in right relationships with Earth.

Diana Oleskevich mph  
Remember that you are stardust, and unto

stardust you shall return! Lenten joy.  
Diana Oleskevich csj/a  
Justice Coordinator  
Sisters of St. Joseph of Carondelet  
St. Louis Province

Margaret P. Gilleo  
40 Willow Hill  
St. Louis, Missouri 63124

Statement for the Department of Natural Resources Hearing  
March 29, 2004

My name is Margaret Gilleo and I am a college professor. I teach Ethics. In our society, most political decisions are based on the philosophy of utilitarianism. This means that the deciding factor is the greatest good for the greatest number of people.

Holcim corporation has said that it will provide some 1,000 initial construction jobs and 200 permanent jobs in Ste. Genevieve County. What is wrong with America that the only way that these people can find jobs is for a Swiss corporation to come to the rescue? What has happened to American ingenuity, to American entrepreneurship?

I am concerned about jobs. But I am far more concerned about the nearly 1,500,000 people of the Greater St. Louis area. Are we, the people of Greater St. Louis, not entitled to breathe safe and healthy air?

The American Lung Association has rated our city with a grade of "F" for its air quality. As a college professor, I can tell you that is only a catastrophic student who earns a grade of "F." With our city already dramatically failing in air quality, why is the Department of Natural Resources even considering adding yet more pollutants to our air?

Holcim claims they will use the best air pollution control technology. Exactly what emissions does this technology control and to what level? What assumptions are the calculations based upon? If and when these assumptions prove untrue, will the permits be reevaluated? What emissions will be produced that technology does not control? Does using certain pollution control technologies mean that there will be no additional air pollution in St. Louis?

In a situation involving risk to public health, concern for the common good requires that the Precautionary Principle be applied. This principle states that, when an activity raises threats of harm to human health, precautionary measures must be taken even if some cause and effect relationships are not fully established scientifically. A more simplified yet wise summation of this principle is the old adage "Better safe than sorry." Thus, the burden of proof of harmlessness of the Holcim production activity lies with the proponents, not with the general public. Decisions applying the precautionary principle must be open, informed, and democratic and must include affected parties. We, the potentially affected public, insist that we be part of the decision, not just granted a polite hearing.

I ask you, whose good is being considered in the decision to allow the Holcim plant to be built in St. Genevieve County? What about the greatest good for the greatest number of people?